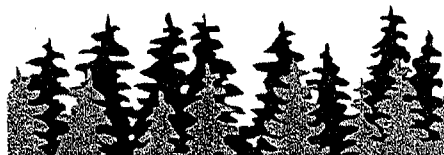


**APPENDIX D**

**WATER QUALITY TARGETS  
FOR PARAMETERS OF CONCERN**



## Water Quality Targets for Parameters of Concern

Parameter	Sacramento River	San Joaquin River	Delta
Boron		Water: Mouth of Merced to Vernalis: <b>2.0 mg/L</b> (15 Mar. - 15 Sept.) <sup>d</sup> <b>0.8 mg/L</b> (monthly mean, 15 Mar. - 15 Sept.) <sup>d</sup> <b>1.0 mg/L</b> (monthly mean, 16 Sept. - 14 Mar.) <sup>d</sup> <b>1.3 mg/L</b> (monthly mean, critical year) <sup>d</sup>	Water: Agricultural intakes: <sup>zz</sup> <b>&lt; 0.7 mg/L</b>
Cadmium	Water: River and tributaries from above State Route (SR) 32 bridge at Hamilton City: <b>0.22 µg/L</b> <sup>a,c,d</sup>  Below Hamilton City: <b>2.2 µg/L</b> (4-day average) <sup>a,c</sup> <b>4.3 µg/L</b> (1-hour average) <sup>a,c</sup>  Sediment: <sup>z</sup> <b>5.0 ppm</b> (dry weight)	Water: <b>2.2 µg/L</b> (4-day average) <sup>a,c</sup> <b>4.3 µg/L</b> (1-hour average) <sup>a,c</sup>  Sediment: <sup>z</sup> <b>5.0 ppm</b> (dry weight)	Water: East of Antioch Bridge: <b>2.2 µg/L</b> (4-day average) <sup>a,c</sup> <b>4.3 µg/L</b> (1-hour average) <sup>a,c</sup>  West of Antioch Bridge: <b>1.1 µg/L</b> (4-day average) <sup>x</sup> <b>3.9 µg/L</b> (1-hour average) <sup>x</sup>  Sediment: <sup>z</sup> <b>1.2 ppm</b> (dry weight)
Copper	Water: River and tributaries from above SR 32 bridge at Hamilton City: <b>5.6 µg/L</b> <sup>a,c,d</sup>  Below Hamilton City: <b>10 µg/L</b> (no hardness connection) <sup>a,d,f</sup>  Sediment: <sup>z</sup> <b>70.0 ppm</b> (dry weight)	Water: <b>9.0 µg/L</b> (4-day average) <sup>a,c</sup> <b>13 µg/L</b> (1-hour average) <sup>a,c</sup>  Sediment: <sup>z</sup> <b>70.0 ppm</b> (dry weight)	Water: East of Antioch Bridge: <b>10 µg/L</b> (no hardness connection) <sup>a,d,f</sup>  West of Antioch Bridge: <b>6.5 µg/L</b> (4-day average) <sup>x</sup> <b>9.2 µg/L</b> (1-hour average) <sup>x</sup>  Sediment: <sup>z</sup> <b>34.0 ppm</b> (dry weight)
Mercury (inorganic)	Water: <b>0.012 µg/L</b> (4-day average) <sup>b,c</sup> <b>2.1 µg/L</b> (1-hour maximum) <sup>a,c</sup>  Sediment: <sup>z</sup> <b>0.15 ppm</b> (dry weight)  Tissue: <sup>iy</sup> <b>0.5 µg/gm</b> (whole fish, wet weight) These tissue targets are related to human health and do not necessarily ensure no adverse effects on fish	Water: <b>0.012 µg/L</b> (4-day average) <sup>b,c</sup> <b>2.1 µg/L</b> (1-hour maximum) <sup>a,c</sup>  Sediment: <sup>z</sup> <b>0.15 ppm</b> (dry weight)  Tissue: <sup>iy</sup> <b>0.5 µg/gm</b> (whole fish, wet weight) These tissue targets are related to human health and do not necessarily ensure no adverse effects on fish	Water: East of Antioch Bridge: <b>0.012 µg/L</b> (4-day average) <sup>b,c</sup> <b>2.1 µg/L</b> (1-hour maximum) <sup>a,c</sup>  West of Antioch Bridge: <b>0.025 µg/L</b> (4-day average) <sup>x</sup> <b>2.4 µg/L</b> (1-hour average) <sup>x</sup>  Sediment: <sup>z</sup> <b>0.15 ppm</b> (dry weight)  Tissue: <sup>iy</sup> <b>0.5 µg/gm</b> (whole fish, wet weight) These tissue targets are related to human health and do not necessarily ensure no adverse effects on fish

*Water Quality Targets for Parameters of Concern (Continued)*

Parameter	Sacramento River	San Joaquin River	Delta
Selenium	Water: 20 µg/L (1-hour maximum) <sup>b,c</sup> 5.0 µg/L (4-day average) <sup>b,c</sup>  Tissue: <sup>aa</sup> <4 ppm (fish, whole body, dry weight) <3 ppm (fish food items, food chain, dry weight)	Water: <sup>j</sup> South of Merced River: 20 µg/L (1-hour maximum) <sup>b,c</sup> 5.0 µg/L (4-day average) <sup>b,c</sup>  North of Merced River: 12 µg/L (maximum) <sup>b,c</sup> 5.0 µg/L (4-day average) <sup>b,c</sup>  Tissue: <sup>aa</sup> <4 ppm (fish, whole body, dry weight) <3 ppm (fish food items, food chain, dry weight)	Water: East of Antioch Bridge: 20 µg/L (1-hour maximum) <sup>b,c</sup> 5.0 µg/L (4-day average) <sup>b,c</sup>  West of Antioch Bridge: 20 µg/L (1-hour average) <sup>b,c</sup> 5.0 µg/L (4-day average) <sup>b,c</sup>  Tissue: <sup>aa</sup> <4 ppm (fish, whole body, dry weight) <3 ppm (fish food items, food chain, dry weight)
Zinc	Water: River and tributaries from above SR 32 bridge at Hamilton City: 16 µg/L <sup>a,c,d</sup>  Below Hamilton City: 100 µg/L (no hardness connection) <sup>a,d,g</sup>  Sediment: <sup>z</sup> 120.0 ppm (dry weight)	Water: 120 µg/L (4-day average) <sup>a,c</sup> 120 µg/L (1-hour average) <sup>a,c</sup>    Sediment: <sup>z</sup> 120.0 ppm (dry weight)	Water: East of Antioch Bridge: 100 µg/L (no hardness connection) <sup>a,d</sup>  West of Antioch Bridge: 106 µg/L (4-day average) <sup>x</sup> 117 µg/L (1-hour average) <sup>x</sup>  Sediment: <sup>z</sup> 150.0 ppm (dry weight)
Carbofuran	Water: <sup>k</sup> 0.4 µg/L (daily maximum and total pesticide) <sup>h</sup>	Water: 0.4 µg/L (daily maximum and total pesticide) <sup>h</sup>	Water: 0.4 µg/L (daily maximum and total pesticide) <sup>h</sup>
Chlordane	Water: 2.4 µg/L (instantaneous maximum) <sup>c</sup> 0.0043 µg/L (4-day average, total pesticide) <sup>c</sup>  Sediment: <sup>z</sup> 7.1 ppm (dry weight)	Water: 2.4 µg/L (instantaneous maximum) <sup>c</sup> 0.0043 µg/L (4-day average, total pesticide) <sup>c</sup>  Sediment: <sup>z</sup> 7.1 ppm (dry weight)	Water: 2.4 µg/L (instantaneous maximum) <sup>c</sup> 0.0043 µg/L (4-day average, total pesticide) <sup>c</sup>  Sediment: <sup>z</sup> 7.1 ppm (dry weight)
Chlorpyrifos	Water: <sup>m</sup> 0.02 µg/L (4-day average, total pesticide) <sup>l,g</sup>	Water: <sup>m</sup> 0.02 µg/L (4-day average, total pesticide) <sup>l,g</sup>	Water: <sup>m</sup> 0.02 µg/L (4-day average, total pesticide) <sup>l,g</sup>
Diazinon	Water: <sup>n</sup> 0.08 µg/L (1-hour average, total pesticide) <sup>l</sup> 0.04 µg/L (4-day average, total pesticide) <sup>l</sup>	Water: <sup>n</sup> 0.08 µg/L (1-hour average, total pesticide) <sup>l</sup> 0.04 µg/L (4-day average, total pesticide) <sup>l</sup>	Water: <sup>n</sup> 0.08 µg/L (1-hour average, total pesticide) <sup>l</sup> 0.04 µg/L (4-day average, total pesticide) <sup>l</sup>

*Water Quality Targets for Parameters of Concern (Continued)*

Parameter	Sacramento River	San Joaquin River	Delta
DDT	Water: 1.1 µg/L (instantaneous maximum, total pesticide) <sup>c</sup> 0.001 µg/L (4-day average, total pesticide) <sup>c</sup>	Water: 1.1 µg/L (instantaneous maximum, total pesticide) <sup>c</sup> 0.001 µg/L (4-day average, total pesticide) <sup>c</sup>	Water: East of Antioch Bridge: 1.1 µg/L (instantaneous maximum, total pesticide) <sup>c</sup> 0.001 µg/L (4-day average, total pesticide) <sup>c</sup>  West of Antioch Bridge: 1.1 µg/L (instantaneous maximum) <sup>c</sup> 0.001 µg/L (24-hour average) <sup>c</sup>
	Tissue: <sup>y</sup> 1 µg/L (whole fish, wet weight)	Tissue: <sup>ay</sup> 1 µg/L (whole fish, wet weight)	Tissue: <sup>y</sup> 1 µg/L (whole fish, wet weight)
PCBs	Water: 0.014 µg/L (4-day average) <sup>c</sup> (each of seven congeners)	Water: 0.014 µg/L (4-day average) <sup>c</sup> (each of seven congeners)	Water: East of Antioch Bridge: 0.014 µg/L (4-day average) <sup>c</sup> (each of seven congeners)  West of Antioch Bridge: 0.014 µg/L (24-hour average) <sup>c</sup>
	Sediment: <sup>z</sup> 50 ppm (dry weight, total)	Sediment: <sup>z</sup> 50 ppm (dry weight, total)	Sediment: <sup>z</sup> 50 ppm (dry weight, total)
	Tissue: <sup>y</sup> 0.5 µg/L (whole fish, wet weight, total)	Tissue: <sup>y</sup> 0.5 µg/L (whole fish, wet weight, total)	Tissue: <sup>y</sup> 0.5 µg/L (whole fish, wet weight, total)
Toxaphene	Water: 0.73 µg/L (1-hour average) <sup>c</sup> 0.0002 µg/L (4-day average) <sup>c</sup>	Water: 0.73 µg/L (1-hour average) <sup>c</sup> 0.0002 µg/L (4-day average) <sup>c</sup>	Water: East of Antioch Bridge: 0.73 µg/L (1-hour average) <sup>c</sup> 0.0002 µg/L (4-day average) <sup>c</sup>  West of Antioch Bridge: 0.0002 µg/L (4-day average) <sup>c</sup>
	Tissue: <sup>y</sup> 0.1 µg/L (whole fish, wet weight) (sum of nine organochlorine insecticides)	Tissue: <sup>y</sup> 0.1 µg/L (whole fish, wet weight) (sum of nine organochlorine insecticides)	Tissue: <sup>y</sup> 0.1 µg/L (whole fish, wet weight) (sum of nine organochlorine insecticides)
pH	Water: > 6.5 ≤ 8.5 <sup>vv</sup>	Water: > 6.5 ≤ 8.5 <sup>vv</sup>	Water: ≥ 6.5 ≤ 8.5 <sup>vv</sup>  Agricultural intakes: <sup>ww</sup> < 1.5 me/L
Ammonia	Water: 0.08 - 2.5 µg/L (4-day average) <sup>cp</sup> 0.58 - 35 µg/L (1-hour average) <sup>cp</sup>	Water: 0.08 - 2.5 µg/L (4-day average) <sup>cp</sup> 0.58 - 35 µg/L (1-hour average) <sup>cp</sup>	Water: 0.08 - 2.5 µg/L (4-day average) <sup>cp</sup> 0.58 - 35 µg/L (1-hour average) <sup>cp</sup>

*Water Quality Targets for Parameters of Concern (Continued)*

Parameter	Sacramento River	San Joaquin River	Delta
Bromide*			Water: Drinking water intakes: <b>&lt;50 µg/L</b> <sup>gg, hh, ll</sup>
Total organic carbon (TOC)*			Water: Drinking water intakes: <b>&lt;3 mg/L</b> <sup>gg-pp</sup>
Chloride			Water: Agricultural intakes: For surface irrigation: <sup>bb</sup> <b>SAR: &lt; 3</b> <sup>cc</sup>  For sprinkle irrigation: <sup>dd</sup> <b>&lt; 3 me/L</b>  Drinking water intakes: <b>250 mg/L</b> <sup>ii, rr</sup> ; <b>150 mg/L</b> <sup>ss</sup>
Nutrients (nitrate)			Drinking water intakes: <b>10 mg/L</b> <sup>jj</sup> ; no increase in nitrate levels <sup>mm</sup>
Salinity (EC <sub>w</sub> )		Agricultural intakes: <b>&lt;0.7 dS/m</b> <sup>cc</sup>	Agricultural intakes: <b>&lt; 0.7 dS/m or µmho/cm</b> <sup>cc</sup>
Salinity (EC)	Water: Knights Landing above Colusa Drain: <sup>xx, yy</sup> <b>≥ 230 µmho/cm</b> (50 percentile) or <b>≥235 µmho/cm</b> (90 percentile)  I Street Bridge: <sup>xx, yy</sup> <b>≥240 µmho/cm</b> (50 percentile) or <b>≥340 µmho/cm</b> (90 percentile)	Water: Friant Dam to Gravelly Ford: <sup>xx</sup> <b>≥ 150 µmho/cm</b> (90 percentile)	
SAR:EC <sub>w</sub> relationship <sup>ff</sup>			Water: Agricultural intakes: <sup>aaa</sup> SAR    EC <sub>w</sub> : <b>0 - 3    &gt; 0.7</b> <b>3 - 6    &gt; 1.2</b> <b>6 - 12   &gt; 1.9</b> <b>12 - 20 &gt; 2.9</b> <b>20 - 40 &gt; 5.0</b>
Total dissolved solids (TDS)			Agricultural intakes: <b>&lt; 450 mg/L</b> <sup>zz</sup>  Drinking water intakes: <b>&lt; 220mg/L (10-yr avg)</b> <sup>oo</sup> ; <b>&lt; 440mg/L (monthly avg)</b> <sup>oo</sup>

## Water Quality Targets for Parameters of Concern (Continued)

Parameter	Sacramento River	San Joaquin River	Delta
Dissolved oxygen	Water: Keswick Dam to Hamilton City (June 1 to August 31): 9.0 mg/L <sup>d,q</sup>  Below I Street Bridge: 7.0 mg/L <sup>d</sup>	Water: Between Turner Cut and Stockton (September 1 through November 30): 6.0 mg/L <sup>d</sup>	Water: <sup>s</sup> All Delta waters west of Antioch Bridge: 7,000 µg/L (minimum) <sup>d,x</sup>  All Delta waters: 5.0 mg/L <sup>d,r</sup>
Pathogens			Water: Drinking water intakes: no MCL standard <sup>kk</sup> , <1 oocyst/100L for <i>Giardia</i> and <i>Cryptosporidium</i> <sup>mm</sup>
Temperature	Water: Keswick Dam to Hamilton City: < 56° F <sup>d,u</sup>  Hamilton City to I Street Bridge: < 68° F <sup>d,u</sup>  I Street Bridge to Freeport: < 68° F <sup>d,v</sup>  I Street Bridge to Freeport (January 1 through March 31): < 66° F <sup>d,w</sup>	Water: At Vernalis: < 68° F <sup>d,v</sup>	Water: West of Antioch Bridge: < 5°C increase above for receiving water designated as cold or warm fresh-water habitat <sup>x</sup>  Alteration of temperature shall not adversely affect beneficial uses <sup>x</sup>
Turbidity			Drinking water intakes: 0.5 or 1.0 NTU <sup>ll</sup> ; 50 NTU <sup>qq</sup>
Toxicity of unknown origin <sup>t</sup>			Water: The RWQCBs have toxicity criteria specific to waters within their regions. CALFED will be working to eliminate toxicity within the Delta as it is defined by the CVRWQCB and the SFBRWQCB.

### NOTES:

Water quality targets have no regulatory meaning within the context of the CALFED Bay-Delta Program (CALFED).

The California Toxics Rule (CTR) (40 CFR, Part 131) was adopted on May 18, 2000. The CTR established numeric criteria for priority toxic pollutants for the State of California. The water quality targets and associated references have not been updated pursuant to this rule; therefore, differences may exist.

- \* On December 3, 1997, a meeting was held between the drinking water industry, U.S. Environmental Protection Agency (EPA), and CALFED, to identify source water quality targets for bromide and TOC. As a result of the discussion, urban water agencies are going to further analyze different levels of treatment for different levels of a constituent and report their findings to CALFED.

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## Water Quality Targets for Parameters of Concern (Continued)

### NOTES (continued):

- <sup>a</sup> Dissolved form.
- <sup>b</sup> Total recoverable form.
- <sup>c</sup> The effects of these concentrations were measured by exposing test organisms to dissolved aqueous solutions of 40 mg/L hardness that had been filtered through a 0.45-micron membrane filter. Where deviations from 40 mg/L of water hardness occur, the objectives shall be determined in mg/L using the following formulas:
- $$\text{Cu} = e^{(0.905)(\ln \text{ hardness})} - 1.612 \times 10^{-3}$$
- $$\text{Zn} = e^{(0.830)(\ln \text{ hardness})} - 0.289 \times 10^{-3}$$
- $$\text{Cd} = e^{(1.160)(\ln \text{ hardness})} - 5.777 \times 10^{-3}$$
- <sup>d</sup> Central Valley Regional Water Quality Control Board (CVRWQCB) Water Quality Control Plan.
- <sup>e</sup> General EPA Section 304(a) guideline.
- <sup>f</sup> Within the year, the State Water Resources Control Board (SWRCB) or EPA will promulgate/adopt objectives that depend on hardness. The adoption language likely will contain a clause stating that the most stringent objective applies. Sometimes the 10-µg/L objective will be more stringent; at other times, the new rule will be more stringent.
- <sup>g</sup> Similar to the objectives for copper, we expect the SWRCB or EPA to promulgate new objectives within the year that will be more stringent than current objectives.
- <sup>h</sup> The CVRWQCB expects to adopt an objective for carbofuran within the year. The objective probably will be very similar to the performance goal.
- <sup>i</sup> Water quality-limited segments for mercury in fish tissue occur in the Sacramento River and Delta.
- <sup>j</sup> Water quality-limited segments for selenium in the water column occur from Salt Slough to Vernalis on the San Joaquin River.
- <sup>k</sup> The lower Sacramento River is a water quality-limited segment for carbofuran.
- <sup>l</sup> California Department of Fish and Game (DFG) acute (1-hour) and chronic (4-day) hazard assessment criteria.
- <sup>m</sup> The Sacramento River, San Joaquin River, and Delta are water quality-limited segments for chlorpyrifos.
- <sup>n</sup> The Sacramento River, San Joaquin River, and Delta are water quality-limited segments for diazinon.
- <sup>o</sup> The San Joaquin River is a water quality-limited segment for DDT in tissue.
- <sup>p</sup> Values are a function of pH, temperature, and designation of water body as cold- or warm-water fish beneficial use.
- <sup>q</sup> When natural conditions lower dissolved oxygen (DO) below this level, the concentrations shall be maintained at or above 95% of saturation.
- <sup>r</sup> Except those water bodies that are constructed for special purposes and from which fish have been excluded or where the fishery is not important and a beneficial use.
- <sup>s</sup> The south Delta around Stockton is a water quality-limited segment for DO.
- <sup>t</sup> Bioassay results or other special studies demonstrate toxicity. The Sacramento River, San Joaquin River, and Delta are water quality-limited segments for toxicity of unknown origin.
- <sup>u</sup> The temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City nor above 68°F in the reach from Hamilton City to the I Street Bridge when temperature increases will be detrimental to the fishery.
- <sup>v</sup> The daily average water temperature shall not be elevated by controllable factors above 68°F from the I Street Bridge to Freeport on the Sacramento River, and at Vernalis on the San Joaquin River between April 1 through June 30 and between September 1 through November 30 in all water-year types.
- <sup>w</sup> The daily average water temperature shall not be elevated by controllable factors above 66°F from the I Street Bridge to Freeport on the Sacramento River between January 1 through March 31.
- <sup>x</sup> San Francisco Bay Regional Water Quality Control Board objectives at 100-mg/L hardness. Formulas for calculating objectives for varying hardness levels are as follows:
- $$\text{Cd} = e^{(0.7852H - 3.490)} \text{ (4-day average).}$$
- $$= e^{(1.128H - 3.828)} \text{ (1-hour average).}$$
- $$\text{Cu} = e^{(0.8545H - 1.465)} \text{ (4-day average).}$$
- $$= e^{(0.9422H - 1.464)} \text{ (1-hour average).}$$
- $$\text{Zn} = e^{(0.8473H + 0.7614)} \text{ (4-day average).}$$
- $$= e^{(0.8473H + 0.8604)} \text{ (1-hour average).}$$
- <sup>y</sup> National Academy of Sciences - National Academy of Engineering 1973.
- <sup>z</sup> Effect range-low (ERLs) concentrations.
- <sup>aa</sup> San Luis Drain Reuse, Technical Advisory Committee selenium ecological risk guidelines.
- <sup>bb</sup> For surface irrigation, most tree crops and woody plants are sensitive to sodium and chloride; use the values shown. Most annual crops are not sensitive; use the salinity tolerance in Ayers and Westcot or equivalent.
- <sup>cc</sup> SAR means sodium adsorption ratio. SAR sometimes is reported by the symbol RNa.

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## Water Quality Targets for Parameters of Concern (Continued)

- <sup>dd</sup> For overhead sprinkle irrigation and low humidity (< 30%), sodium and chloride greater than 70 or 100 mg/L, respectively, have resulted in excessive leaf adsorption and crop damage to sensitive crops; see Ayers and Westcot.
- <sup>ee</sup> EC<sub>w</sub> means electrical conductivity of irrigation water, reported in  $\mu\text{mho}/\text{cm}$  or dS/m.
- <sup>ff</sup> At a given SAR, the infiltration rate increases as salinity EC<sub>w</sub> increases. To evaluate a potential permeability problem, examine SAR and EC<sub>w</sub> together.
- <sup>gg</sup> The objective is to provide source water meeting the target or that will provide an equivalent level of public health protection in treated drinking water.
- <sup>hh</sup> Bromide value is predicated on the assumption that the maximum contaminant level (MCL) for bromate will be 5  $\mu\text{g}/\text{L}$  in treated water.
- <sup>ii</sup> EPA secondary MCL for treated water, 1995.
- <sup>jj</sup> EPA current MCL for treated water, 1995.
- <sup>kk</sup> EPA requires removal of 99.9 % of *Giardia* and 99.99% of viruses during water treatment. Higher levels of removal are required in poor water quality source waters.
- <sup>ll</sup> Target level based on the California Urban Water Agencies' (CUWA's) Expert Panel report recommendations (Bay-Delta Water Quality Criteria, December 1996). The Expert Panel assumed a future drinking water regulatory scenario for disinfection by-product (DBP) control and inactivation of *Giardia* and *Cryptosporidium*, based on the proposed Stage 2 D/DBP Rule and Proposed Enhanced Surface Water Treatment Rule (ESWTR). The bromide target level is constrained by the formation of bromate when using ozone to inactivate *Cryptosporidium*.
- <sup>mm</sup> Nutrients are a critical reservoir management issue. Nutrient levels are a determining factor governing the growth of taste- and odor-producing algae in water storage reservoirs. State Water Project (SWP) supplies are nitrogen-limited; however, phosphorous is present in great excess. This is a problem with respect to the growth of blue-green algae, which can fix their own nitrogen. Water quality impacts of nutrients are driven by reservoir management issues as opposed to human health effects; as a result, use of the MCL for nitrate (as N) of 10 mg/L is not appropriate.
- <sup>nn</sup> Desirable target levels are based on likely future regulatory scenarios under the ESWTR that will base required levels of pathogen removal/inactivation treatment on pathogen density in source water. Future regulations may require removal requirements for *Cryptosporidium*. Increasing treatment for removal of pathogens makes it more difficult to control the formation of DBPs. To balance disinfection requirements for controlling pathogens with the production of DBPs, selection of a Bay-Delta alternative should not result in degraded water quality that necessitates increased removal requirements for pathogens.
- <sup>oo</sup> Target levels for total dissolved solids (TDS) would allow compliance with the TDS objectives contained in Article 19 of the SWP Water Service Contract. The average TDS levels in SWP supplies over the last 10 years consistently have exceeded the 220-mg/L (10-year average) SWP objective. The 10-year averaging period for the 220 mg/L-objective is too long to be sufficiently protective of source water quality. The Metropolitan Water District of Southern California (MWD) staff currently are exploring the development of appropriate alternative TDS objectives for shorter time frames (i.e., 1-year and 6-month averages) and will forward that information to CALFED when available. The SWP TDS objective of 440 mg/L (monthly average) is a problem for water resource management programs, especially in April and September, and there is a real need to reduce peaks in TDS in SWP supplies. Consistently low TDS levels are needed to minimize the following salinity-related impacts: (1) increased demand for Delta water supplies when such water is used to blend with other higher salinity water sources; and (2) adverse impacts on water recycling and groundwater replenishment programs, which depend on Delta water supplies to meet local resource program salinity objectives. Failure to develop local resource programs may result in increased demand on Delta exports and economic impacts on industrial, residential, and agricultural water users.
- <sup>pp</sup> Target level based on the CUWA Expert Panel report recommendations (Bay-Delta Drinking Water Quality Criteria, December 1996). The Expert Panel assumed future drinking water regulatory scenario for DBP control and inactivation of *Giardia* and *Cryptosporidium* based on the proposed Stage 2 D/DBP Rule and proposed ESWTR. The proposed D/DBP Rule requires increased levels of TOC removal as TOC concentrations in source waters increase. The recommended TOC target level is constrained by the formation of total trihalomethanes when using enhanced coagulation for TOC removal and free chlorine to inactivate *Giardia*.
- <sup>qq</sup> Reduced variability in turbidity is needed to improve treatment plant performance. When source water turbidity increases, water is more difficult and costly to treat. Also, increased turbidity reduces protection from pathogens because turbidity interferes with disinfection.
- <sup>rr</sup> Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. May 1995. 95-IWR. SWRCB and Cal-EPA. According to the Water Quality Control Plan, this value applies from October to September during all water-year types for the Contra Costa Canal at Pumping Plant No. 1, West Canal at the mouth of Clifton Court Forebay, the Delta-Mendota Canal at the Tracy Pumping Plant, Barker Slough at the North Bay Aqueduct intake, and Cache Slough at the City of Vallejo intake.
- <sup>ss</sup> Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, May 1995. 95-IWR. SWRCB and Cal-EPA. According to the Water Quality Control Plan, this value applies to a certain number of days per year, depending on water-year type, to the Contra Costa Canal at Pumping Plant No. 1 and the San Joaquin River at Antioch Water Works intake.



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*Water Quality Targets for Parameters of Concern (Continued)*

- <sup>tt</sup> Recommendation of September 30, 1997, from Karen Schwinn, Water Division, EPA.
- <sup>uu</sup> Recommendation of July 24, 1997, from Bruce Macler, Water Division, EPA.
- <sup>vv</sup> Changes in normal ambient pH levels shall not exceed 0.5 in fresh water with designated cold- or warm-water beneficial uses.
- <sup>ww</sup> Alkalinity as CaCO<sub>3</sub>.
- <sup>xx</sup> At 25°C, CVRWQCB Water Quality Control Plan.
- <sup>yy</sup> Based on the previous 10 years of record. CVRWQCB Water Quality Control Plan.
- <sup>zz</sup> A Compilation of Water Quality Goals, March 1998 edition, plus December 1998 update, CVRWQCB.
- <sup>aaa</sup> From Water Quality for Agriculture, R. S. Ayers and D. W. Westcot, 1985, Food and Agriculture Organization of the United Nations, Rome.
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